PRODUCT STARATEGIES OVER DIFFERENT STAGES OF THE PRODUCT LIFE CYCLE : A STUDY OF DIESEL ENGINE AND CONSUMER ELECTRONICS INDUSTRIES OF INDIA

by
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INDUSTRIAL AND MANAGEMENT ENGINEERING PROGRAMME

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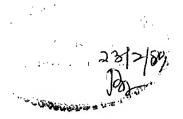for the Degree of

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by

SANJAY JOSHI

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CERTIFICATE

This is to certify that the present work on " Product Strategies Over Different Stages of the Product Life Cycle : A study of Diesel Engine and Consumer Electronics Industries of India " by Mr. Sanjay Joshi has been carried out under my supervision and has not been submitted elsewhere for award of a degree.

February, 1989.

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February, 1989.   Sanjay Joshi

CONTENTS

Abstract

Empirical research on product life cycle (PLC) concept has focused primarily on the study of consumer non-durables. The most obvious gap in the knowledge of the PLC, therefore, involves industrial goods and to an extent consumer-durables. The present study is an attempt to fill this gap.

The research questions of specific interest in this study are :

1. What are the specific differences in product strategies across the stages of the PLC ?

2. Are the differences comparable across different types of businesses (Industrial and consumer durable) ?

3. What does this evidence imply for theories relating the PLC and business strategy ?

Three leading Diesel Engine manufacturers and six Consumer Electronics firms of India have been included in the study. Results indicate that modifications in product strategies between certain stages of product life cycle are prevalent. It also indicates that strategies not only depend on stage of the product life cycle but also on business environment. Although the results do not warrant the conclusion that PLC is the major determinant of product strategies, they generally support the consideration of this contingency factor during strategy formulation.

CHAPTER I

INTRODUCTION

Product life cycle (PLC) is a concept that helps us categorize products and visualise their strategy. A product in the early stage of life cycle is expected to have a strategy which is quite different from one in the Mature stage. For example it has been suggested sometimes that a "leadership" strategy may be adopted at introduction, a "niche" strategy at maturity and a "harvest" strategy at decline [31]. Researchers have also used it widely along with other variables that could determine strategy [1].

Moreover, the duration of the product life cycle may be said to be shrinking, largely due to improvement in speed of product development. This observable shrinkage of time between birth and saturation of a product poses two major challenges to the management. Firstly, if the firm is to maintain growth, management must be continually concerned with adding new products to the firm and divesting from products which can no longer meet the firm's growth objectives. Secondly management must anticipate transitions in the stages of life cycle and revise firm's strategy to respond to changing competitive factors [3]. Hofer has gone to the extent of saying that the most fundamental

variable in determining an appropriate business strategy is the stage of the product life cycle [20].

1.1 Need for the present Study:

The empirical research, relating business strategy and the stage of product life cycle, to date is often limited in scope. It is oriented towards analysis of the growth and maturity stages only and focused primarily on the study of consumer non-durables. It lacks multidimensional approach as suggested by Rink and Swan [29].

Prior studies have indiscriminately pooled firms into single composites. Not only does the tradition of business policy argue for care in considering firms in to combination but so too does the strategy construct itself [19]. In formulating and implementing strategies nature of environment is critical. In fact the firm must match its internal capabilities to the environmental opportunities and threats in order to achieve its goal. Some environments may be more favourable than others. This environment must be given due consideration in pooling of the firms. Moreover, previous studies have drawn samples from a generalized database such as PIMS [34]. This precludes the possibility of seeking industry specific factors. Industry specific studies can thus enhance the findings by providing specific examples and conditions.

The present study seeks to analyze the specific differences in product strategy across the stages of product life cycle for

two different business environments and types of business (Industrial & Consumer Goods). The data is drawn from 3 leading Diesel Engine manufacturers and 6 Consumer Electronics firms of India. Diesel Engine and Consumer Electronics industries were chosen for the study because most of the firms in these industries are substantially in only one business. This selection filters the effect of a conglomerate strategy as a whole for different product/market areas.

CHAPTER II

PRODUCT LIFE CYCLE - A LITERATURE REVIEW

2.1 The Product Life Cycle (PLC) Concept:

A product exists as one solution among many to meet a need. For example, the human race has a need for "calculating power", and this need has grown over the centuries with the expansion of trade. The changing need level is described by demand life cycle curve, the highest curve shown in Fig. (2.1). There is first a stage of emergence (E), followed by stage of accelerating growth (G), maturity (M) and decline (D).

Now, a need is satisfied at the time by some technology. The need for "calculating Power" was first satisfied by finger counting, later by abacuses, still later by slide rules, adding machines, hand calculators and computers. Each new technology exhibits a demand technology life cycle shown by curves T_1 and T_2 in Fig(2.1). Within a given demand technology life cycle, however, there will appear a succession of product forms, that satisfy a specific need at a time. Thus, while hand calculator provided a new technology offering of "calculating power", it generated many product forms with their own life cycles. In the beginning it took a product form of rather large plastic box with small screen and numerical keys, which could perform only basic
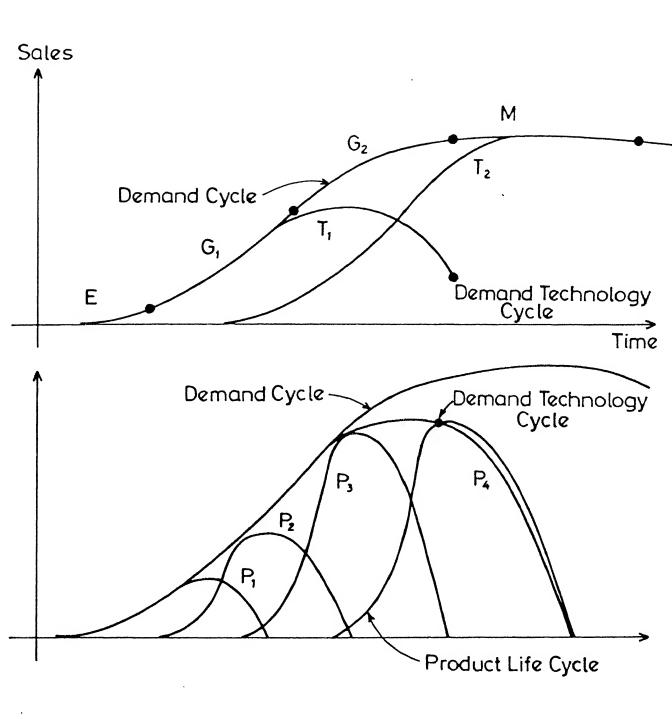
Fig. (2.1) Demand-Technology-Product Life Cycles.

tasks.   This form was succeeded by smaller size hand   calculator that could perform even more mathematical operations. P_1, P_2, P_3 in Fig(2.1) show these product form life cycles.

The PLC could thus carry different connotations.   In the present study, the PLC refers to product form life cycle.   That is it represents the unit sales curve for some product form, extending from the time it is first placed on the market until it is removed. It is an attempt to recognize the distinct stages in the sales history of the product.

Schematically, the PLC may be approximated by bell shaped curve, Fig. (2.2) that is divided into several stages.   Although the number of stages suggested in PLC literature varies between four and six, a four stage cycle - introduction, growth, maturity and decline - is adopted.

The theoretical rationale behind the PLC concept emanates from the theory of diffusion and adoption of innovations [22]. An innovation refers to any good, service or idea that is perceived by some one as new. Adoption on other hand is the decision of an individual to become regular user to a product. Essentially the concept implies that a product finds initial resistance to wide spread acceptance ,of some new way of behaving and purchased by only a limited segment of the buying population. Later as the products performance and value are known and communicated, a larger segment of buyers adopt it and sales begin to increase at a faster pace.   Eventually rate of growth
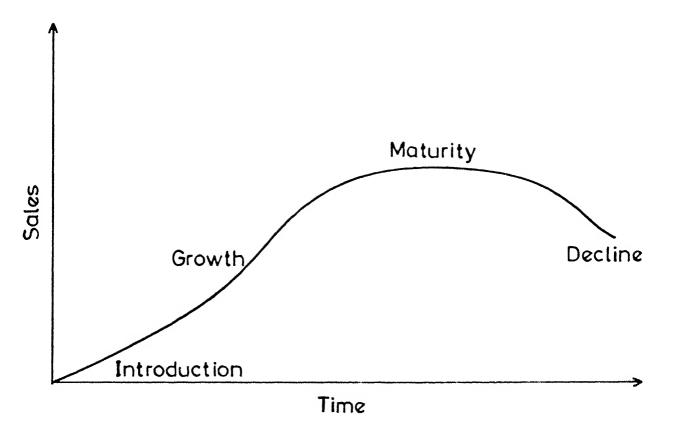
Fig. (2.2)   Classical PLC Shape.

decreases as the proportion of adopters gets closer and closer to a maximum, with most sales representing repeat purchases. The rate of adoption may remain constant and then diminish in decline phase [22].

2.2 Factors Determining Parameters of the Life Cycle:

Numerous forces influence the sequence and duration of the stages, the shape of the curve, and the magnitude of sales at each transition to a new stage in product life cycle (PLC). Some products like industrial robots diffuse very slowly in the industrial market while others virtually bypass this stage. The determinants of rate of diffusion as pointed by George S. Day [13] includes:

- The perceived comparative advantage of the new product relative to the best available alternative.

- Barriers to adoption (such as commitment to existing facilities or incompatibility with existing values) will slow acceptance even when other factors are supportive.

- Information and availability of the product.

A number of factors, which are latent during initial uncertainties assume importance as growth accelerates. Changes in the relationships with substitute products determines how quickly the new product will replace the substitute and how much of volume will be replaced. As Midgeley [25] shows, the shape of the life cycle curve can be explained by ratio of mean adoption

time (which depends on the duration of the diffusion process) to mean inter purchase time. As cumulative sales penetration approaches ultimate market capacity and growth rate slows, the dominating factor becomes the replacement rate [13].

2.3 Types of PLC Patterns:

The classical PLC shape Fig. (2.2) has been only one of the many types Fig. (2.3) of PLC patterns noticed by investigators. Some 15 different studies of consumer non-durables and durables as well as four studies of industrial goods, provide good bit of evidence that some products have validated the classical PLC curve [29]. On the other hand, "cycle-recycle" pattern has been found in four studies, including ethical drugs [9], food products and household products [26]. The second "hump" in the sales is caused by a promotional push in decline stage. Another common pattern is "scalloped" consisting of a succession of life cycles based on the discovery of new product characteristics, uses or users. Nylon's sales, for example, show scalloped pattern because of many uses - parachutes, hosiery, shirts, carpeting discovered over time [23]. Researchers and writers also cite the common reasons of changing market and economic conditions as well as reaction to competitors as major factors determining shape of PLC curve.

2.4 Industries and Products Included in PLC Studies:

Twelve different studies on consumer non-durable goods have been the major focus of PLC research, followed by nine studies in

Sales Revenue

Time

Introduction Growth | Decline

Maturity

$Y = a + bX + cX^2$

III. Innovative Maturity

Sales Revenue

Sales Revenue

Time

$Y = a\ bX + cX^2 + dX^3 + eX^4$

IV. Increasing Sales [a,d,e]
V. Decreasing Sales [a,e]

Sales Revenue

IV

V

Time

IV $Y = a + bX$ ——
V $Y = a - bX$ ----

VI. High Plateau [a]
VII. Low Plateau [a]

Sales Revenue

High Plateau

Low Plateau

Time

$Y = a$

VIII. Stable Maturity [b,d]

Sales Revenue

Time

IX. Growth Maturity

Sales Revenue

Time

X. Cycle-Half Recycle [a]

Sales Revenue

Time

$Y = a + bX + cX^2 + dX^3$

XI. Growth Decline Plateau [c]

Sales Revenue

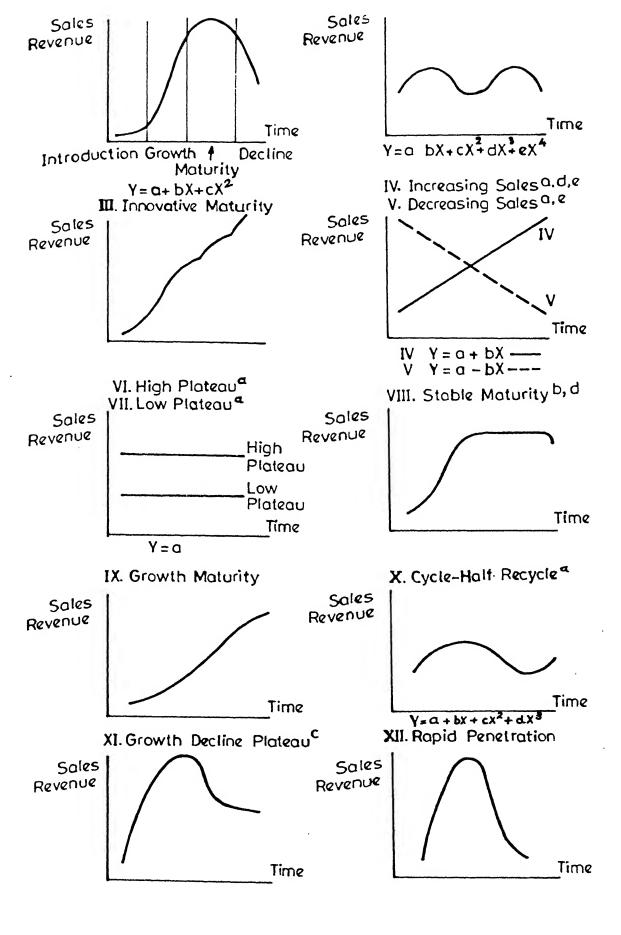Time

XII. Rapid Penetration

Sales Revenue

Time

Fig. (2.3) Types of Product Life Cycle Patterns.

consumer durable items [31]. In contrast, two studies of industrial durables and two of industrial non-durables have been reported [29].

2.5 Level of Product Aggregation:

Typically, there are three levels of product aggregation - class, form and brand. Product class represents items that are substitutes for the same want. Items which belong in different product classes should have near zero cross elasticity of demand. Thus a product class includes all those objects that despite differences in shape, sizes and technical characteristics are essentially substitute for same needs (e.g. cigarettes, cigars and pipes). Product form is a finer classification of a product class (e.g. regular, menthol cigarettes etc.). Brand on other hand is unique (Wills, Panama etc.).

A major problem with previous PLC studies has been the level of product aggregation. It is vital that these levels be differentiated because the PLC notion has different degree of applicability in these three cases. Product classes possess the longest PLC curves. Product forms probably exhibit the standard PLC histories. Product brands have very erratic sales trends [29]. Most of the writers have accepted the idea that product forms are most appropriate level of the product aggregation to utilize in PLC research [26].

2.6 Research on PLC Stages:

Identification of distinct stages, which reflect different opportunities and threats with respect to marketing strategy and profit potential is an integral part of product life cycle concept [22].   In the research on PLC, we find many different approaches to identify the stages of a product. Polli & Cook [26] examined   the percentage change in real sales of a sample of products between two specific years. Plotting these changes as distribution with mean zero, they suggest that if a product had a percentage change less than - 0.5 times the standard deviation, it was in decline phase. A product with percent change exceeding + 0.5 times the standard deviation was in growth stage. In the range of ± half standard deviation, the product was considered to be in maturity. However, the assumption of distribution of percent changes in sales of product of certain class   is questionable.   No justification could be given for fixation of boundaries   to this theoretical distribution of percentage changes.

William Cox [9] to some extent could succeed in identifying the stages of product life cycle for ethical drugs by using the concept of catalogue life, commercial birth and commercial death.

The major problem of the boundary fixation for identifying various stages of life cycle stem from the sensitivity of life cycle analyses to the choice of measures. Should one use unit volume, current revenue or per capita consumption to measure

sales? Further, complicating the identification of stages is variety of the product life cycle patterns. This makes it unlikely that a products position in its life cycle can be established simply by observing changes in the past sales pattern [14]. Thus one cannot avoid forecasting the future sales path of the product if sensible judgment about the present stage of life cycle is to be made.

2.7 Major Research Needs Involving PLC:

Rink and Swan [29] suggest the need of multidimensional approach to conceptualizing future PLC research. They give several variables segregated into three groups: variables internal to the firm, variables external to the firm but internal to the industry and macro environmental variables, to examine feasible combination of these to stimulate, more extensive and diverse PLC investigations. One major issue which requires considerable work is the problem of stage identification - probably a major hindrance in PLC concept applicability.

CHAPTER III

STRATEGY AND THE STAGE OF PRODUCT LIFE CYCLE

This section gives a brief account of strategy and its link with the stages of product life cycle as given by previous researchers.

3.1 Strategy and Its Importance :

Strategy is a set of (meta) decisions that set up the guidelines for operating decisions in the organization. There are four distinctive aspects of strategy :

1. Yard sticks by which the present and future performance of the firm is to measured. The quality of yard sticks is usually called objectives and the desired quantity goals.

2. Guidelines for developing the firm's relationship with its external environment; what products, technology the firm will develop, where and to whom the products are to be sold and how the firm will gain advantage over competitors.

3. The approach towards establishing internal relations and process within the organization, and

4. Rules by which firm conducts its day-to-day business called major operating policies.

A strategy has several distinguishing characteristics. Firstly the purpose of strategy formulation results in no immediate action. Rather it sets the general direction in which the firm's position will grow and develop. Secondly though strategy and objectives appear to be similar, yet they are distinct. Objectives represents the ends which the firm is seeking to attain, while the strategy is the means to these ends. Lastly strategy and means are interchangeable; both at different points in time and at different levels of organization. For example, some attributes of performance (such as market share) can be objective of the firm at one time and its strategy at other.

The importance of strategy can be looked into by examining the alternative to strategy, which is to have no rules beyond the the simple decision to look for profitable prospects. This would save time, money and executive talent required for thorough strategic analysis. Also the field of potential opportunities will be in no way restricted as objectives and strategies limit the field of search. But counterposed to these are some weighty disadvantages. In absence of strategy there are no rules to guide search of new opportunities both inside and outside the firm. No yard sticks will be able to judge whether a particular opportunity is rare one or whether much better ones are likely to develop in future. Thus there is a danger of premature commitment of resources or failure to utilize resources available in a given budget period. Also project decisions will be of poorer quality

than in the firms with strategy because of lack of focus of its efforts.

Hence advantages of not committing the firm's resources until last moment are pitted against disadvantages of inefficient search, enhanced risks of making bad decisions and lack of control over the overall resource allocation pattern. Thus advantages of strategy outweigh those of total flexibility.

3.2 Strategy and the Stage of the Product Life Cycle :

As described in the above section, the basic characteristics of the match an organization achieves with its environment is called strategy. The environment associated with each product changes with the stage of its life cycle. Different opportunities and threats face a business as the product/market segments in which it competes evolves over time. As a consequence, Hofer recommends that businesses should understand the generic patterns of opportunities and threats associated with different stages of product evolution as they formulate their investment and competitive position strategies [20] . Major changes in basic competitive position are accomplished most easily during transition from one stage to another, as it is during these period the basic nature of competition with in an industry changes. Hence the stage of the life cycle of the product must be considered in strategic decision making. For example, in growth stage instead of seeking the ways of getting customers to "try" the product, the originator should try to get them to "prefer" his brand.

Studies that investigate strategies and have PLC implications are summarized in table (3.1).These findings are mostly taken from Anderson & Zeithmal [1] and Porter [27]. Although some of the findings are contradictory the major trends are summarized below :

Introduction Stage: Strategies For introduction stage are aimed at gaining a strong competitive foot-hold. They emphasize heavy marketing expenditures, product R & D, sub contracting and aggressive pricing.

Growth Stage: In growth stage, marketing appears to be a key factor. High marketing intensity, high advertising, aggressive sales promotion, effective distribution, establishment of strong brand image and building efficiencies in production are emphasized. Product differentiation in terms of design is also a key element.

Maturity Stage: At maturity stage low production costs and marketing effectiveness becomes crucial. Emphasis on extending product breadth, seeking effectiveness via adding channels and vertically integrating.

Decline Stage: At decline stage quick exit from the market is usually recommended. Milking of all possible profit is the key strategic action. Cutting marketing expenses, specializing the channels, simplifying production lines, reducing product differentiation is recommended.

Hence the literature having PLC-strategy implications (table 3.1) suggest that product life cycle, as a planning tool characterizes the main challenges in each stage and suggests major strategies that a firm might pursue. It supports the view that the product life cycle concept can be used to interpret product and market dynamics. Also, as a control tool the PLC concept allows the company to compare product performance against similar products in the past. However, several findings are contradictory. Also most of the studies, reported in table (3.1), being based on generalized databases (such as PIMS) fail to seek industry specific factors. Hence there is a need to enhance these findings by considering industries separately. A more comprehensive framework, chapter IV, is used for this study to take above factors into accounts.

TABLE 4.1

Strategic Variables Suggested by Hofer

1. Frequency of product change.	2. Technological change.
3. Development time for new product	4. Customization.
5. Relative compensation average.	6. Product breadth.
7. Sales promotion / total sales.	8. Product quality.
8. Relative sales force expense.	10. Media advertising.
11. Total inventory / revenue average.	12. Service quality.
13. Product R & D / revenue average. & Process R & D / revenue average	14. Capital utilization.
15. Plant & Equip. newness average.	16. Market segmentation.
17. Investment / revenue average.	18. Distribution.
19. Employee productivity average.	20. Forward integration.
21. Sales promotion / total sales.	22. Backward Integration.

Measures for some of these variables such as plant and equipment newness and employee productivity are not available as these factors can not be attributed to a particular product (form). Also some of the factors such as ratio of Process R & D/ Revenue Average and ratio of Product R & D/ Revenue Average, are insignificant for Indian industries as most of the technologies are "absorbed" rather than developed. Moreover, small chunk of money that flows into R & D can not be attributed to one particular product accurately.

Fourteen
~~Fifteen~~ significant strategic variables selected for the study along with their measures are listed below :

Strategic Variable	Measures/Categories
1. Nature of Advertising	Try the product/brand emphasis/ reinforcement of consumer loyalty
2. Promotional Expenses	Percentage of promotional expense to total sales
3. Distribution	Scale from very wide to selective
4. Trade Margin	Percentage value (retail + whole sale)
5. Product Quality	Scale from very high to acceptable quality
6. Service Quality	Scale from very high to satisfactory
7. Promptness of Delivery	Scale from very high to satisfactory
8. Product Differentiation	Scale from very high to standard product
9. Product Breadth	Number of models of a given product form
10. Kind of Production	Batch/mass production/one of the kind
11. Vertical Integration	Percentage of the value added within the company to the total product value.
12. Frequency of Product change	Once in a year/once in two year/etc.
13. Market Segments	Number of market segments to which a given product is catered
14. Cost Control	Scale from critical to irrelevant

NOTE: Details of the measures can be seen in Questionnaire appended to the thesis.

4.3   Development of Hypotheses:

Keeping in view the strategic variables discussed above, we can now outline the propositions that relate these strategic factors to PLC stage. These hypotheses are based on an analysis of the existing body of literature in the area of product life cycle and strategy.

H 1:

The nature of advertising content for products in introduction and growth stage is to "motivate trial" of the product as against "maintaining loyalty" approach in maturity stage.

Rationale:

The theory of diffusion and adoption of innovations provides rationale for hypothetical "s" shaped PLC curve. When the product is launched, the company has to stimulate awareness, interest, trial and purchase. The consumer-adoption process begins when firm's innovation process leaves off. This process is later followed by consumer loyalty process [22, 35]. As Levitt puts it "In mature stage, instead of seeking ways of getting customers to try the product the originator should try to get them to prefer his brand" [23].

H 2:

Ratio of promotional expenditure to total sales is highest for introduction stage, decreases in growth, rises again in maturity and is least in decline.

Rationale:

The ratio is highest for introduction stage because of the need of high level promotional efforts to inform potential customers, induce trial of the product and secure distribution in retail outlets. In growth stage the advertising is high to meet competition and continue educating the market, but it is a lower percentage of the larger sales volume. In maturity stage, however, ratio is more than growth stage as slow down in growth rate of sales creates over capacity. This over capacity leads to intensified competition and competitors intensify advertising and promotion [9]. In decline stage, it is recommended to cut down all media to bone and use no sales promotion of any kind [17]. Similar recommendation is given my Hambrick and Day to use heavy sales promotion in introduction to entice trial, to reduce it slightly in growth stage to take advantage of ready customer demand, increase it in maturity to encourage brand switching and reduce to minimal in decline [16].

H 3:

Distribution is expected to be selective in introduction stage with distribution Margins high enough, and extensive in

growth stage with dealers margin slightly reduced. In maturity, the company is expected to hold its own distribution outlets and in decline the marginal outlets are expected to be phased out.

Rationale:

During introduction the buyers are very few. As demand starts growing, the distribution network should be widened with reduced trade margin as dealers/retailers are not really forcing the product in the market [23]. In maturity stage producer should concentrate on holding its distribution outlets and must now more than ever communicate directly with the consumer [22].

H 4:

Product quality is not a significant strategic aspect in the introduction stage and increases up to maturity.

Rationale:

During introduction cost of production is very high, due to low volumes of production. Hence it will be highly expensive to inculcate quality into the product. According to Schoeffler's findings quality pays, but in growth stage the quality is less recognizable and sought by customers. Product quality takes time and experience for the customer to recognize and pay premium for. MacMillan et al points out product quality as one of the key directions for mature product [24]. Above trend is also supported by Smallwood [33].

H 5:

Quality of service assumes maximum importance in maturity stage and comparatively less importance in growth stage.

Rationale:

At maturity stage marketing effectiveness becomes crucial. Quality of service becomes an important tool to increase marketing effectiveness [23]. As Thietart and Vivas recommend "achieve highest product service position relative to the competitors in maturity stage" [34].

H 6:

Emphasis on promptness of delivery is more in growth stage than maturity.

Rational:

During growth stage as pointed out product quality is not perceived well and brand preferences are weak or absent. Hence to cope with demand growing at high rate, promptness in delivery becomes major competitive edge [36]. While in maturity brand preferences are strong and loyalty starts dominating, which calls for reduced emphasis on promptness of delivery.

H 7:

Product differentiation is more significant in maturity as compared to growth stage. Products in growth stage differentiate

on technical content and performance while in maturity stage distribution differentiation is emphasized.

Rationale:

Product differentiation attempts to create niches in the market. In maturity stage, when the competition is intensified, objective of the differentiation is to create preferences and loyalties among buyer to reduce their sensitivity to price differentials among existing products or brands in the market [21]. Technical and performance differentiation are important in growth stage and technical is recommended in maturity [7, 36].

H 8:

Cost control assumes maximum emphasis in maturity and least in introduction.

Rationale:

Achieving low costs becomes crucial for products in maturity stage [36]. For instance optimizing capacity utilization, increasing manufacturing stability and routinizing the activities and mass marketing channels help achieve low costs [21]. Galbraith and Nathanson recommends to achieve lowest delivered cost position relative to the competition to gain profitable volume and market share in maturity stage [11].

H 9:

Relative product breadth is greatest during maturity and decreases considerably during decline.

Rationale:

Above hypothesis is empirical finding of the study by Anderson & Zeithmal [1]. Wider product breadth offers greater choice to the consumer and hence increases marketing effectiveness, a crucial aspect for matured products.

H 10:

Production process shifts from batch in growth stage to mass production in maturity.

Rationale:

Just as product passes through a series of major stages, so does the production process used in manufacture of that product [35]. The process evolution typically begins with a "fluid" process - one that is highly flexible - but not very cost efficient and proceeds towards increased standardization, mechanization and automation. This evolution culminates in "systematic processes" that is very efficient, integrated and hence less flexible.

H 11:

Vertical Integration increases upto maturity and decreases in decline stage.

Rationale:

High vertical integration in the initial stages depresses profitability but increases it in the later stages of product

life cycle. Hofer has suggested reasons for this may be that early investments in vertical integration are made at the expense of more profitable investments in marketing related activities but latter investments in vertical integration help gain relative power and thus help maintain better margins [21].

H 12:

Frequency of product changes decreases over the product life cycle.

Rationale:

As the product moves from introduction to maturity greater standardization takes place and hence the frequency of changes reduces over product life cycle. Empirical study by Anderson & Zeithmal supports above proposition [1].

CHAPTER V

METHOD OF STUDY

To analyse the questions stated in the objective of the study, the previous chapter outlined the relevant strategic variables and our hypotheses on them. The several steps covered in the study are:

(1) Identification of PLC stage

(2) Level of product aggregation

(3) Identification of environmental variables

(4) The choice of the sample

5.1 Identification of PLC Stages:

This was one of the important issues as no substantial research has been done to identify the stage of a product accurately. After considerable literature review, we arrived at following conclusion.

The various characteristics of the stages described in Chapter II will help one to recognize the stage a particular product occupies at any given time. The following descriptions, based largely on Anderson and Zeithmal [1], were therefore given

as an aid to respondents for identifying the stage of their product:

Introduction Stage   —   Primary demand of the product just starting to grow; product is still unfamiliar to many potential users.

Growth Stage   —   Demand growing at 10% or more in quantity terms; technology or competitive structure still changing.

Maturity Stage   —   Product familiar to vast majority of prospective users; technology and competitive structure have become stable

Decline Stage   —   Product viewed as commodities; weaker competitors beginning to exit.

However, this description may not always be decisive. Also, to make a consistency check in decision makers' perception, another criterion, of "future projections" of market growth rate and profit margin, is used. The rationale for this criterion is that, looking ahead gives more perspective to the present than looking at present alone [23]. In the words of Levitt, "To know where the present is in the continuum of competitive time and events, it often makes more sense to try to know what the future will bring and when will it bring". Hence one way of seeing current stage is to try to foresee the next stage and work backwards. This is because we know that there are variations in

the market growth rate and profit margin over the stages of PLC as shown in Fig. (5.1). Thus, slight market growth rate with low or negative profit margin characterizes introduction stage, large market growth rate with moderate or high profit margin is characteristic of growth stage, slight market growth rate and high profits imply maturity and negative market growth rate and low profits show decline stage.

5.2 Level of Product Aggregation:

As described in Sec. 2.5 , there are three levels of product aggregation, namely class, form and brand. Previous researchers cite product form as most appropriate level of aggregation for PLC studies. However, a product class may be partitioned in various product forms along different criteria. For examples, cigarettes may be distinguished by presence of filter, by their length and by menthol in tobacco.

The criteria used for identification of product form in this study are:

i) Technological homogeneity: It refers to the group of products which are technically similar e.g., in Diesel engines, products having similar technology, i.e., particular combination of the process of "engine block" manufacturing and the design of "combustion chamber" form a group of technologically homogeneous products.
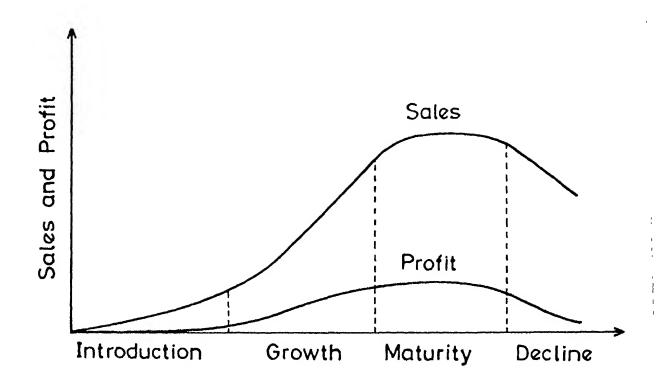
Fig. (5.1) Sales and Profit Life Cycles.

ii) Time of Evolution: It refers to the time when a particular product with a given technology was first launched in the market.

Technologically homogeneous products with same time of evolution are identified as one product form. For example, Diesel engines which use similar technology and launched in the market, more or less, at the same time form one product form. However, if similar technology is used for other engine after a significant span of time, it is identified as different product form.

5.3 Selection of Environmental Variables:

Organizations offer certain products or services to certain customers or clients. Choice of the product/market reduces the environment from "every thing else" to the specific group of suppliers, users, competitors and regulatory agencies upon which the organization is dependent. Strategic decision making is vehicle for adapting to this environment [28]. As described in Sec.(1.1), in formulating and implementing strategies, the nature of environment is critical and must be considered carefully.

The environmental variables selected for the study are:

1) Barriers to entry: This refers to aspects that block the coming in of new entrants into the business. The important barriers are natural barriers such as economies of large scale production, legal barriers like permits, licenses, and marketing

barriers such as those possessed by the holders of strong consumer image.

2)   Technological Change: The extent and the nature of technological change can exert major influence on the nature of effective competitive strategies in particular industries.   The choice of particular R & D strategy would strongly influence   the other types of functional area strategies that firms may   choose. Both the aspects of technological change, product and process, have been assessed in the study.   The scales used are critical to low for process and very high to occasional for product changes.

3)   Competitive Environment: Competitors for raw materials   and parts supply and competitors for customers are main elements of this   environment.   Some industries have relatively   stable competitive environment with high degree of certainty   for   the actions of the competitors as against some which have highly volatile competitive environment and uncertainty for the   actions of competitors.   The factor is measured on the scale from   highly predictable to highly uncertain environment.

4)   Product Complexity: This is a trait of product(s) an industry is producing.   The measure for this factor used is   the intricacy and the number of parts which go in making a   product. The respondent assesses the complexity of product in his industry as compared to other Indian industries.

5)   Capital Intensity: This factor refers to the fixed as   well as working capital required for producing a product(s) or services. Higher capital intensity, generally intensify efforts

on achieving high-volume and capacity utilization The scale used ranges from highly capital intensive to somewhat labour intensive.

6) Sophistication of Buyer: This factor explains the complexity of decision making process that goes in buying of a product. Highly priced, industrial products usually go through much more complex processes of decision making in buying as compared to consumer durables or non-durables. Hence the buyer for the products of an industry can be categorized as sophisticated to relatively unsophisticated.

7) Demand for the Product: This factor accounts for the uncertainties in demand of a product due to its nature. For example, fashion clothes exhibit high uncertainty because of its inherent nature. Such uncertainties are usually low with industrial products. The scale used to measure this factor ranges from high certainty to high uncertainty in demand.

8) Nature of Product: It is basic classification of a product into industrial/consumer and durable/non-durable categories.

5.4 The Sample:

Two industries, Diesel and Consumer Electronics have been selected for the study. The reasons being, firstly industrial products have been neglected in previous researches on PLC-strategy relations. Secondly, the two industries provide considerable difference in their industrial environment to

investigate the effect of environment on the application of PLC-strategy theory and lastly most of the firms in above industries are substantial in one business only.

Three Diesel Engine manufacturers and six Consumer Electronics firms have been included in the study. Three Diesel Engine firms included in the study, together capture about 60% of the Indian diesel engine market and have average sales growth of about 6%. Consumer Electronics firms included in the study together capture about 40% of the total Indian market with average sales growth of 3%. 34 products (form) in Diesel Engines and 47 in Consumer Electronics were considered in the study Responses about these products were collected on Questionnaires (enclosed in Appendix) filled through face-to-face interaction during personal visits to the organizations. Respondents were mostly senior executives of the companies. Questionnaire is divided into three parts. Part one is aimed at the identification of business environment for the industry. Part two was devoted to assessing the product strategies on selected strategic variables and part three was devoted to identification of stage of a product.

Collected responses are subjected to various statistical tests (Chapter VI) to check the validity of hypotheses developed on selected strategic variables. The analysis is cross-sectional.

CHAPTER VI

ANALYSIS

In this chapter, the responses collected from various firms on the questionnaire and from the interviews have been analyzed. The analysis is carried out in two parts. Part 1 deals with the issues related to the business environment of the two selected industries, namely Diesel Engine and Consumer Electronics, while part 2 deals with testing the hypotheses developed in Chapter V to explore the implications of life cycle stage on product strategies for the above two industries.

PART 1

Business environment refers to strategic opportunities and threats in the industry (as a whole) of which the firm is a part. As previously mentioned in the Sec. (1.1), in formulating and implementing strategies, the nature of environment is critical. Some environments are more favorable than others. Hence, the strategy which can be selected may differ depending on the nature of this same environment. We have therefore selected two different industries with different environments and analysed their data separately. The differences in the nature of their environment is outlined below. The important environmental factors of an industry are barriers to entry, rate of

technological change, capital intensity, competitive environment and product complexity. Based on the responses received the business environments of Diesel Engine and Consumer Electronics industries have been assessed in Table (6.1).

Diesel engines are industrial durables, whereas consumer electronics industry produces consumer durables. Diesel Engines, moreover, have come to acquire an ever important place in economic development. As a major source of power, it is being used for large number of purposes in transport, industrial and agricultural spheres. Today, there are five major competitors in this industry and a few aspiring to enter. Any new entrant in this field, however, faces high barriers to entry as shown in Table (6.1). This is due to several reasons. Firstly, a high degree of technical expertise is required in manufacturing of diesel engine which is essentially a complex product to manufacture. Existing market leaders and competitors would have considerable advantage over new entrants in this aspect. Secondly, any new entrant will face the problem of developing suppliers specially for critical items like cylinder block and cylinder head as it is not feasible to be completely self dependent by having all manufacturing capacities in house. Lastly pressures on foreign exchange will force new entrants to reduce the import content of parts before they are well developed indigeniously. Lack of wide and efficient service network can also prove fatal. Raw material costs being somewhat high, 50 - 60% of the total product value, the economies of scale for the

industry are not too significant. Responses indicate rates of technological changes (product and process) to be moderate as shown in Table (6.1). There is also a high degree of certainty in predicting actions of competitors, which makes competitive environment stable.

Table 6.1

Comparison of the environments for the two selected industries.

Factor	Diesel Engine	Consumer Electronics
Entry Barriers	High	Low
Rate of Tech. Change	Moderate	High
Capital Intensity	High	Low
Competitive Environment	Stable	Stable
Demand Uncertainty	Low uncertainty	Low uncertainty
Product Complexity	Complex	Relatively simple
Buyer Sophistication	Sophisticated	Unsophisticated
Nature of Product	Industrial durable	Consumer durable

The progress of the Consumer Electronics sector has been at a galloping rate. This industry has witnessed 12 folds increase

in its output since 1976. The Govt. policies have changed to enable even FERA and MRTP companies to take up manufacturing of these products. The beneficial changes in the policies of the Govt. scope of broad banding of licenses, helpful adjustments in import and excise duties, the opportunity even for multinationals to take up the production and low capital investment makes this industry attractive for new entrants. However, marketing barriers are high, because some existing companies have established strong goodwill and brand preferences in the market. Economies of scale are low as only raw material and components account for 60-70 percent of the total cost of the product. Being an electronic industry, the changes are rapid and sometimes revolutionary, quick responses to such changes becomes vital and essential. Responses indicate the demand to be largely predictable and stable competitive environment. Thus, the two industries have markedly different environments.

PART 2

Hypotheses developed in Chapter V, describe significance of different strategic variables over the four stages of the product life cycle. The first step towards testing these hypotheses is to ascertain the stage of a product.

Stage Identification

The main application suggested for the PLC is to plan changes in product strategy as the product moves from one stage

to another.   Identification of the stages is therefore a prerequisite for application of PLC in strategic planning.

In defining the stage of a product life cycle, two criteria have been used.

Criterion 1: The current stage of a product is self reported by the respondent based on the following descriptions of each stage.

Introduction Stage   -   Primary demand of the product just starting to grow; product is still unfamiliar to many potential users.

Growth Stage   -   Demand growing at 10% or   more   in
                                    quantity   terms;   technology   or
                                    competitive structure still changing.

Maturity Stage   -   Product familiar to vast majority of
                                    prospective   users;   technology   and
                                    competitive structure have become stable.

Decline Stage   -   Product viewed as commodities; weaker
                                    competitors beginning to exit.

Criterion 2:   As   suggested   by Levitt, Sec.   (2.6), <u>future projections</u> of market growth rate and profit margin, if worked backwards, help identify the <u>current stage</u> of a product.   For example if projected market growth rate and profit margin in future are reported as negative and very low respectively, the product can be identified to be decline stage. This method of

assessment is also used by us. However, in general the previous criterion has proved dominant, as the table below shows.

In case of mismatching of the two identification criteria by a respondent i.e. when the stage identified by Criterion 1 is different from the stage identified by Criterion 2. The data has been dropped out. Similar strategy is adopted in case of conflict about a product between respondents.

After dropping the confounded items, we arrive at a relationship between criterion 1 and possible states of criterion 2 and the inferred stage. This is listed in the table below:

Criterion 1	Criterion 2			Inferred
Current Stage	Future Projections			Stage of PLC
	Market Growth Rate	Profit Margin		
I	Slight	Low	Infers ------->	I
I	Slight	Very Low		I
G	Large	High		G
G	Very Large	High		G
G	Large	Low		G
M	Slight	Low		M
M	Slight	High		M
M	Slight	Very Low		M
D	Negative	Low		D
D	Negative	Very Low		D

I - Introduction, G - Growth,   M - Maturity, D - Decline

As a result of this identification, the stage-wise distribution
of product forms of the two industries considered in our analysis
is as below.

Stage of PLC	Diesel Engine	Consumer Electronics
Introduction	4	-
Growth	11	32
Maturity	14	10
Decline	5	5

No product could be identified in introduction stage in Consumer
Electronics industry.

Hypothesis Testing:

In all the test carried out in this section, the following
abbreviations have been used -

I = Introduction   G = Growth   M = Maturity

D = Decline α = Significance level

1. The Nature of Advertising

(a) Diesel Engine -

The nature of advertising content was not found significant
for this industry. Almost all respondents indicated that
advertising is for company as a whole and not for the individual

products. These advertisements usually convey the range of products made by the company and their salient features.

(b) Consumer Electronics -

The nature of advertising in consumer electronics products can be recategorised as an emphasis on -

(i) Trial of the product plus brand emphasis, or

(ii) Brand emphasis plus maintaining loyalty approach.

A Chi-squared test supports the hypothesis (at a significant level of 0.02) that during growth stage the advertisement emphasis is predominantly on "try the product" approach as against "maintaining loyalty" approach in maturity stage.

2. Promotional Intensity

For testing the hypothesis on promotional intensity, two tests for growth and maturity, are conducted to examine the significant difference, if any, in the ratio of promotional expenditures to total sales (PE/TS). For Diesel Engine industry, results show no significant difference in this ratio for products in growth and maturity stages, but for declining products, the ratio is less as compared to matured products.

For Consumer Electronics, the ratio (PE/TS) is high for the products in growth stage as compared to products in maturity stage, while for declining products, it is less than matured ones. To gain some more insight, televisions and VCR, two growth products were removed because promotional expenditures for these

are substantially higher than other growth products to over come stiff competition. Results thereafter, show no significant difference in the ratio (PE/TS) for growth and maturity stages.

Factor: Percentage of Promotional Expenditure to Total Sales.

(a) Diesel Engine

Growth	0.1 0.5 0.2 0.3 0.5 0.2 0.5 0.2 0.5 0.2 0.5
Maturity	0.2 0.5 0.5 0.2 0.5 0.2 1.0 0.5 0.2 0.5 0.5 0.2 0.2 0.5
Decline	0.1 0.5 0.2 0.1 0.5

Hypothesis:	Test	Result
G < M	Mann Whitney U	Not supported
D < M		Supported
		$\alpha = 0.04$

(b) Consumer Electronics

Growth	4 3 3 4 3 3 4 3 5 4.5 2 3 2 4 3.5 6 5 7 6 4 6 5 7 6 4 6 5 3 9 3 9 3
Maturity	3 2.5 1 4 3.5 2.5 4 3.5 2.5 4
Decline	1 0.8 0.5 1 1

Hypothesis:	Test	Result
G < M	Mann Whitney U	Not supported
D < M		Supported $\alpha = 0.01$

Remarks - G > M in electronics at significance level of 0.01

3.   Distribution Policy

The data on distribution policy, given in the tables below
is not clearly amenable to statistical tests of earlier stated
hypothesis. However, the data reveals the following patterns.

In Diesel Engine industry, during introduction stage, the
distribution policy is generally of selective distribution
outlets, while in decline stage, there is a tendency   to
concentrate the distribution network. In growth and maturity,
there is a common need to have wide distribution.

In Consumer Electronics, however, there is a wide variation
in distribution policies for products in growth stage. A wide
distribution network appears to find more favour for both growth
and maturity products. For declining products there is obvious
attempt to concentrate the distribution network.

(Frequency of Responses in various categories)

	Diesel Engine				Consumer Electronics		
Distribution Network	I	G	M	D	G	M	D
Wide and considered appropriate	–	2	11	–	13	9	–
Wide and trying to still widen it	–	–	–	–	12	–	–
Wide but Co. plans to concentrate it	–	–	2	2	2	–	5
Selective and considered appropriate	4	–	–	3	–	–	–
Selective and Co. plans to widen it	–	9	1	–	5	1	–

4. Trade Margin

Tests carried out indicate no substantial difference in trade margin for products in introduction and growth stages for Diesel Engine industry. However, trade margin for matured products was less as compared to growth for both the industries. After excluding televisions and VCR, two growth products, the trade margin for which are substantially higher than rest of the electronics growth products, results indicate no substantial difference in trade margin for products in growth and maturity stages in electronics.

Factor: Trade Margin

Categories	Diesel Engine	
	I	G
0 - 5%	1	8
6 - 10%	3	3

Hypothesis	Test	Result
I > G	Chi-Squared	Not supported

5. Quality

(a) Diesel Engine -

The two aspects of quality: product quality and service were both rated high and very high by all respondents. This was

further explained by respondents in the following manner. Diesel
Engines are highly priced products, normally used for continuous
operation. Lack of product quality or quick service can result
in long down times, heavy maintenance cost and thus prove to be
financial burdens on customers. Industrial buyers would not buy
highly priced diesel engines without assurance of both, high
quality of product and service. The manufacturers cannot
therefore, have a "strategy" of low quality for products of any
life cycle stage.

(b)   Consumer Electronics -

Hypothesis tests are carried out to examine significant
difference, if any, in product and service quality for growth and
maturity stages. Results indicate more emphasis on product
quality during maturity stage as compared to growth. However, no
significant difference is observed in service quality between the
two stages.

Factor: Product Quality

Category	Consumer Electronics	
	G	M
Very High	1	7
High	20	2
Moderate	11	1

Hypothesis	Test	Result
G < M	Chi-squared	Supported $\alpha < 0.01$

Factor: Product Service

Category	Consumer Electronics	
	G	M
Very High	8	3
High	17	4
Moderate	7	3

Hypothesis	Test	Result
G < M	Chi-squared	Not Supported

6. Promptness of Delivery of Product

This factor is not of much relevance to Consumer Electronics. In case of Diesel Engines, no significant difference in promptness of delivery for products in growth and mature stages was observed, which is always high. But in decline stage the emphasis clearly reduces. Frequency of responses in various categories are tabulated as follows:

Category	Growth	Maturity	Decline
Very high	3	5	-
High	8	9	-
Moderate	-	-	4
Satisfactory	-	-	1

7.   Product Differentiation

Product differentiation is significantly more in growth stage as compared to introduction for Diesel Engines while no substantial difference is observed between products in growth and maturity stages, in both the industries.

Factor: Product Differentiation

Category	Diesel Engines			Consumer Electronics	
	I	G	M	G	M
Very High	–	–	4	8	2
High	1	9	10	21	7
Low	3	2	–	3	1

Hypothesis	Test	Diesel Engine	Consumer Electronics
I < G	Chi-squared	Supported $\alpha = 0.05$	–
G < M		–	Not Supported

8.   Nature of Differentiation

No general pattern of differentiation could be arrived at for growth and maturity stages from the responses received from the two industries. However, for consumer electronics industry technical differentiation assumed more important in growth stage (46%) as compared to maturity (30%). Also appeal differentiation

was emphasized more in maturity stage (76%) as compared to growth stage (46%) for consumer electronics.

Frequency of various responses are shown below:

Diesel Engine				Consumer Electronics		
Nature of differen- tiation	G	M		Nature of differen- tiation	M	G
P	6	1		P & A	6	5
P & D	2	5		P	1	12
T & P	2	4		T,P & A	3	10
T	-	3		T & P	-	5
T, P & D	1	1				

P - Performance, T - Technical,   D - Distribution, A - Appeal

9.   Cost Control

Emphasis on cost control, for both the industries, is observed to be significantly more in maturity stage as compared to growth stage. For diesel engines, moreover, emphasis on cost control for growth stage is found to be more than introduction stage.

Factor: Cost Control

Category	Diesel Engine			Consumer Electronics	
	I	G	M	G	M
Critical	–	1	5	1	6
Significant	–	5	8	15	3
Moderate	4	5	1	16	1

Hypothesis	Test	Diesel Engine	Consumer Electronics
G < M	Chi-Squared	Supported $\alpha < 0.01$	Supported $\alpha < 0.01$

10. Product Breadth

Product breadth for matured products is found to be more as compared to products in growth stage for diesel engines. However, no significant difference is observed between growth and maturity stages for consumer electronics.

Factor: Product Breadth

(a) Diesel Engine

Growth	3	3	4	4	3	4	1	2	3	5	3			
Maturity	8	12	6	4	4	3	4	4	1	4	4	9	12	7

Hypothesis	Test	Result
G < M	Mann Witney U	Supported $\alpha < 0.01$

Growth	6 9 5 4 2 2 3 2 2 1 2 3 4 2 1 2 2 8 6 5 3 4 6 5 5 2 1
	2 5 4 2 2
Maturity	8 4 2 1 1 7 4 2 4 9

Hypothesis	Test	Result
G < M	Mann Witney U	Not supported

11. Frequency of Product Changes

Results indicate frequency of product changes to be more in introduction stage than growth for diesel engines. Also frequency of changes (design and features) in product is observed to be less in maturity than growth for both the industries.

Factor: Frequency of Product Changes

(a) Diesel Engine

Introduction	1 1 0.5 1
Growth	0.5 0.5 0.33 0.33 0.33 0.33 0.4 0.5 0.33 0.33 0.33
Maturity	0.125 0.125 0.10 0.16 0.2 0.3 0.2 0.2 0.2 0.2 0.16
	0.3 0.125 0.2

Hypothesis	Test	Result
G > M	Mann Witney U	Supported $\alpha < 0.01$
I > G		Supported $\alpha < 0.01$

(b) Consumer Electronics

Growth	0.5 0.5 0.66 0.8 1 0.5 0.8 0.4 0.66 0.8 0.5 0.33 0.8
	0.66 0.66 0.5 0.33 0.5 0.66 0.66 0.5 0.5 0.5 0.5 0.66
	0.5 0.4 0.5 0.5 0.5 0.4 0.5
Maturity	0.2 0.2 0.25 0.33 0.4 0.25 0.25 0.33 0.25 0.2

Hypothesis	Test	Result
G > M	Mann Witney U	Supported $\alpha < 0.01$

12. Production Process

Production process for most of the products in both the industries, irrespective of the stage was reported to be of batch type. Comparatively low demands of different models of diesel engine and frequent changes in product design in electronics industries explains this.

13. Vertical Integration

Results indicate vertical integration to be increasing upto maturity stage and decreasing in decline stage for diesel engine as well as consumer electronics industry.

Factor: Vertical Integration

(a) Diesel Engine

Introduction	22	25	30	25							
Growth	30	32	40	40	35	35	30	35	35	35	30
Maturity	38	42	40	42	45	45	40	45	35	40	38
	40	38	35								
Decline	25	30	30	28	32						

Hypothesis	Test	Result
G > I	Mann Witney U	Supported $\alpha < 0.01$
M > G		Supported $\alpha < 0.01$
D < M		Supported $\alpha < 0.01$

(b) Consumer Electronics

Growth	30	28	28	30	25	28	30	25	27	30	35	28	35	30
	30	28	28	30	28	30	30	27	30	30	35	30	35	28
	25	27	25	27										
Maturity	35	30	30	38	35	38	35	35	32	35				
Decline	25	27	27	30	25									

Hypothesis	Test	Result
M > G	Mann Witney U	Supported $\alpha < 0.01$
D < M		Supported $\alpha < 0.02$

CHAPTER VII

CONCLUSIONS

The analysis of data indicates that modifications in product strategies between certain stages of product life cycle are prevalent. Different patterns of strategic choices are observed over four stages of the product life cycle. Although no unique strategy for each stage of life cycle exists, some actions seem to be more effective than others depending on the stage of life cycle.

Findings common to both the selected industries, Diesel Engines and Consumer Electronics indicate following conclusions. Promotional expenses are significantly more in maturity stage as compared to decline. The distribution policy seems to be selective during introduction with common tendency to widen it as product matures. Cost control and vertical integration are emphasized more in maturity stage. Frequency of product changes reduces as the product passes over four stages of PLC.

However, industry specific results show that for Consumer Electronics industry product quality assumes more importance in maturity stage, which in contrast is always high for Diesel Engines. Product breadth is larger in maturity stage for Diesel Engines as compared to growth, while no such significant difference is observed for Consumer Electronics. Advertising is

significant only for Consumer Electronics emphasizing trial of the product during introduction and growth stages and maintaining loyalty during maturity.

Nevertheless, the stage does not provide complete explanation for a given product strategy. Quality of product and services, seem to be more strongly associated with the nature of product than with the stage itself for industrial durables. Different patterns of strategic choices are observed. These diverse patterns are related to stage of the life cycle as well as business environments. This observation reinforces the view that any inference drawn from aggregated data could be misleading.

Some of the findings, such as - promotional measures are not intensified in maturity as compared to growth, and product differentiation seems equally significant during growth and maturity stages, challenge the recommendations found in strategic planning literature based on PLC theory. Personal interactions with executives of industries visited reveal that though the stage of the PLC is not directly used in formulating product strategies, the competitive environment, which is function of the stage of PLC dictates strategy formulation and implementation. This makes us conclude that PLC concept is implicitly used in arriving at suitable strategy. Although the results do not warrant the conclusion that the PLC is the major determinant of product strategy, they generally support consideration of this contingency factor during strategy formulation.

The study has several limitations. Firstly the analysis is cross sectional and hence fails to trace how businesses change

their strategies as the product moves from one stage to another. Secondly the only contingency variable included is the stage of product life cycle. Other factors such as goal structure (short term/long term) and strategic postures of business have not been taken into account.

By challenging some of the generally accepted normative statements proposed by strategic planning literature, the study calls for further researches in these areas. As only two industries, Diesel Engine and Consumer Electronics have been included in the study, future investigations needs to be undertaken in other industries to test the findings.

APPENDIX

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Dear Sir,

This questionnaire is aimed at some aspects related to the Maturity of your Products and the different Product Strategies being employed. In the enclosed sheets, we request you to opine about your Business Environment / Strategy of product_____ / Stage of Evolution of your product.

This study is towards my M.Tech dissertation being conducted under the supervision of Dr.A.P.Sinha. I request you to kindly spare some of your valuable time to give your responses. I assure you that all information will be treated in strict confidence and analysed in a manner that ensures this.

Thanking you,

Yours sincerely,

Sanjay Joshi,
M.Tech. ,IME,
IIT, Kanpur.

QUESTIONNAIRE ON BUSINESS ENVIRONMENT

The questions in this section are aimed at the identification of business environment for your industry. Please indicate your choice by ticking ( ) an option which is most applicable to your industry.

1. In this industry the governmental restrictions (Foreign trade regulations, environmental protection laws and other government regulations) as compared to other industries in India are -

      a. Highest among the industries.
      b. Comparatively higher than most of the industries.
      c. Same as most of the industries.
      d. Comparatively lower than most of the industries.
      e. Lowest among all the industries.

2. The economies of scale in this industry as compared to other Indian industries is -

      a. Very high.
      b. High.
      c. Moderate.
      d. Low.

3. Importance of automation in manufacturing in this industry is -

      a. Critical.
      b. High.
      c. Moderate.
      d. Some what.
      e. Low.

4. This Industry is -

      a. Highly capital intensive.
      b. Some what capital intensive.
      c. Some what labour Intensive.

5. The actions of our Competitors are -

      a. Highly uncertain.
      b. Largely uncertain.
      c. Neither predictable nor uncertain.
      d. Some what predictable.
      e. Highly predictable.

In terms of the complexity in decision making process that goes in buying the product,the buyer in this industry is -

    a. Highly sophisticated.
    b. Relatively Unsophisticated.

Frequency of changes in product features/design in this industry at an all India level is -

    a. Highest among all the Indian industries.
    b. More than many other Indian industries.
    c. On par with other Indian industries.
    d. Occasional changes.

The demand for the product of this industry is -

    a. Highly certain.
    b. Largely certain.
    c. Some what uncertain.
    d. Highly Uncertain.

Product complexity (the number of parts and their intricacy) for this industry is -

    a. Largest among the Indian industries.
    b. Larger than most of the Indian industries.
    c. Comparable with other Indian industries.
    d. Relatively less than other Indian industries.

4. The approximate agency commission / trade margin (whole sale + retail) currently being allowed for the product is

        a. Between 0 to 5 % .
        b. Between 6 to 10 % .
        c. Between 11 to 15 % .
        d. Between 16 to 25 % .
        e. Between 26 to 35 % .
        f. Above 35 % .

5. Emphasis on the product quality is -

        a. Very high.
        b. High.
        c. Moderate.
        d. Acceptable quality.

6. Emphasis on quality of after sales service is -

        a. Very high.
        b. High.
        c. Moderate.
        d. Satisfactory.

7. Emphasis on promptness of delivery of product is -

        a. Very high.
        b. High.
        c. Moderate.
        d. Satisfactory.

8. Product differentiation (i.e. difference between your product and other competing products in the market either technically,performance wise or distribution wise) is -

        a. Very high.
        b. Significant.
        c. Low.
        d. Almost standard product.

9. Please specify the nature of product differentiation. (if any)
You can tick more than one option if applicable.

        a. Technical content.
        b. Performance.
        c. Distribution.
        d. Appeal.
        e. other. (please specify)

10. For the strategy of this product,the emphasis on cost control is -

        a. Critical.
        b. Significant.
        c. Moderately important.
        d. Some what important.
        e. Irrelevant.

11. Are there any variations (models) of this product .

                                    (yes / no)

    If yes,give the number of models _____

12. Frequency of changes in product features / product design,Please specify -
    (e.g. once in a year/ once in five years/ twice in a year etc.)

    _____

13. Kind of production for the product -

        a. Batch production.
        b. Mass production.
        c. One of a kind. (job shop)

14. Vertical integration : Please specify (approximately)

    Final cost of the product per unit.

                                        _____

    Value of the bought out components.

                                        _____

    Value of the raw materials used in the product.

                                        _____

15. Among all the segments of the market for which this product
    ,and   its minor variations ,could qualify , Please   describe
    the market segments for which this product is NOT used -

    Description of the excluded segments :

    1._____

    2._____

    3._____

    4._____

16. Major functional concern for the product -
    You can tick more than one if applicable.

            a. R & D.
            b. Production.
            c. Purchase.
            d. Cost control.
            e. Marketing.
            f. FInance.
            g. Distribution.
            h. Other. (please specify)

QUESTIONNAIRE ON STAGE OF EVOLUTION OF THE PRODUCT

Please answer the following queries about your product.

1. Product (Name & Specification):

    _____

    _____

2. For the above mentioned product how do you project the future (say next 3/4 years) on following lines. Please tick the most applicable alternative.

    A. Market growth rate.

        a. Very large.
        b. Large.
        c. Slight.
        d. Negative.

    B. Profit Margin.

        a. Very high.
        b. High.
        c. Low.
        d. Very low.
        e. Negative.

3. How would you describe the stage of the product based on following description.

Introduction Stage	: Primary demand of the product just starting to grow.Product is still unfamiliar to many potential users.
Growth Stage	: Demand growing at 10% or more in quantity terms;technology or competitive structure still changing.
Maturity Stage	: Product familiar to vast majority of prospective users;technology and competitive structure have become stable.
Decline Stage	: Product viewed as commodities ; weaker competitors beginning to exit.

    (tick)   Introduction / growth / maturity / decline.

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